REMARKS

Claims 1-9 are pending in the application.

Claims 1-3 and 7-9 are withdrawn from consideration.

Claim 4 and 5 are rejected under 35 U.S.C. § 102(b).

Claim 6 is rejected under 35 U.S.C. § 103(a).

Applicants request reconsideration and allowance of the claims in light of the following remarks.

Claims Rejection – 35 USC § 102

Claim 4 and 5 are rejected under 35 U.S.C. § 102(b) as being allegedly anticipated by U.S. Patent No. 6,043,929 issued to Delavaux. Applicants respectfully traverse this rejection.

The Office Action asserts that Delavaux teaches "an array-type optical device having enhanced pumping efficiency, comprising: ... a pumping light source disposed above the linear gain medium structures for pumping the gain medium structures by means of light directed downward there from [figure 2, source P_2] ...". Applicants respectfully disagree.

FIG. 2 of Delaveaux illustrates a plan view of a waveguide amplifier in which both pump signal P_1 and second pump signal P_2 are incident upon sides of the waveguide plane at an input port 46 and an output port 56. Accordingly, the second pump signal P_2 of Delavaux is not oriented in a normal direction from the waveguide plane and is certainly not above or below the waveguide plane. Applicants respectfully submit that the second pump source P_2 of Delavaux commonly referred to those in the art as a 'backward pumping source' and is used to increase the inversion state at the output of the optical amplifier.

In addition, FIGS. 3 and 4 of Delaveaux are plan views of alternative embodiments of waveguide amplifiers. Referring to FIG. 3, the pump light at wavelength λ_p is incident from side of the waveguide plane on the endface 66 of the waveguide 62. This is a typical example of optical side-pumping mechanism and it is the reason why the phrases of "side-pumping" are used in the "Brief Description of the Drawings," especially in the description of FIGS. 3 and 4. Referring to FIG. 2 of Delaveaux, pump signal P_1 and information signal S are both incident on the same input port 46 of amplifier 30, where input port 46 is defined as the endface of first single mode region 36 (or waveguide 34). In this case, one would require additional device in

addition to current description (figure 2); such as wavelength division coupler, to couple pump and signal beam in the same waveguide – which means increased cost and lowered efficiency. Referring to FIGS. 3 and 4 of Delaveaux, pump signal P_1 and information signal S are incident on different input ports, and there will be no problem as in the case of Fig. 2. However, the devices shown in FIGS. 3 and 4 require an additional waveguide for optical pumping (for example, waveguides 62 and 72), which makes the optical device complicated. The disadvantages of the side-pumping configurations are disclosed in Delaveaux are already described at page 1, lines 16-28 of the specification as originally filed.

For at least the aforementioned reasons, Applicants respectfully submit that Delavaux fails to teach "a pumping light source disposed above the linear gain medium structures for pumping the gain medium structures by means of light directed downward there from" as recited in claim 4 and, therefore, fails to anticipate claim 4. See M.P.E.P. § 2131.

Additionally, FIG. 2 of Delaveaux does not show an array type optical device. The waveguide amplifier shown in FIG. 2 has only one input port and one output port. In fact, FIG. 2 of Delavaux illustrates a typical adiabatic waveguide structure, built on a planar waveguide amplifier which is commonly practiced in the community. For at least this reason, Applicants respectfully submit that the waveguide amplifier shown in FIG. 2 of Delavaux is not an "An array-type optical device…" as recited in claim 4 and, therefore, fails to anticipate claim 4. See M.P.E.P. § 2131.

The Office Action asserts that that the structures designated at reference numbers 34, 38, 40, 48 and 50 in FIG. 2 of Delavaux correspond to a "plurality of linear gain medium structures … wherein the linear gain medium structures are densely disposed and curved at their terminals." Applicants respectfully disagree. Reference number 34 corresponds to a waveguide and reference numbers 38, 40, 48 and 50 correspond to various regions of the waveguide 34. See Delavaux, column 7-26. Because, Delavaux teaches a single waveguide 34, Delavaux fails to teach "plurality of linear gain medium structures" as recited in claim 4 and certainly fails to teach "wherein the linear gain medium structures are densely disposed and curved at their terminals" as also recited in claim 4. For at least these additional reasons, Applicants respectfully submit that Delavaux fails to anticipate claim 4. See M.P.E.P. § 2131.

Claim 5 depends from claim 4 and, therefore, includes each and every element recited in claim 4. Accordingly, Applicants respectfully submit that Delavaux fails to anticipate claim 5 for at least the reasons presented above with respect to claim 4.

Claims Rejection – 35 USC § 103

Claim 6 is rejected under 35U.S.C. § 103(a) as being unpatentable over Delavaux in view of U.S. Patent No. 6,810,060 issued to Vetrovec. Applicants respectfully traverse this rejection.

Claim 6 depends from claim 4 and, therefore, includes each and every element recited in claim 4. As shown above, Delavaux fails to anticipate claim 4. Moreover, Vetrovec does not contain any teaching which, when combined with Delavaux, renders claim 4 obvious. Accordingly, Applicants respectfully submit that the combination of Delavaux in view of Vetrovec fails to render claim 4 obvious for at least the reasons presented above with respect to claim 4. See M.P.E.P. § 2143.03.

CONCLUSION

For the foregoing reasons, reconsideration and allowance of claims 4-6 of the application as amended is requested. The Examiner is encouraged to telephone the undersigned at (503) 222-3613 if it appears that an interview would be helpful in advancing the case.

Respectfully submitted,

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